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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/264,719	03/09/1999	TETSUNOBU KOCHI	35.C13389	3618

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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER
WU, DOROTHY

ART UNIT	PAPER NUMBER
2697	

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/264,719	KOCHI ET AL.	
	Examiner	Art Unit	
	Dorothy Wu	2697	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-7 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-7 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 09 March 1999 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5-7.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. Figures 1-5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: on page 4, line 15, part 13 is a "transfer diode," while on line 19, it is referred to as a "transfer electrode." On page 5, the disclosure teaches an exhibit titled "An Active Pixel Sensor Fabricated Ysing CMOS/CCD Process Technology." On page 6, line 13, the phrase "allows achieve" occurs. Appropriate correction is required.

The disclosure is objected to because of the following informalities: it mentions parts of the invention without including their reference numbers numerous times. A few examples occur on page 3, lines 2, 8, and 9, page 4, lines 9-11, and page 5, lines 6, 20, and 21. Appropriate correction of these and subsequent omissions of references numbers is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 7 is rejected under 35 U.S.C. 112, 2nd paragraph. Claim 7 recites the limitation "setting MOS transistor" in line 28 of page 23. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Williams et al, U.S. Patent 3,845,295.

Regarding claim 1, the admitted prior art teaches a solid state image pickup apparatus (page 1, lines 11-13) with a photoelectric conversion element (page 1, lines 18-26, and page 5, lines 23-24). The apparatus further comprises a transfer switch means for transferring a signal charge generated in the photoelectric conversion element and a floating diffusion area for receiving the signal charge (page 2, lines 4-15, page 5, lines 24-26, and Fig. 4). The admitted prior art also teaches a reset switch means for resetting the potential of the floating diffusion area (page 6, lines 6-9). Because the apparatus is a CMOS sensor (page 5, line 18), the transfer and reset switches will be fabricated from MOS transistors. Figs. 2 and 3 of the admitted prior art

teach that the floating diffusion and reset regions are held at the same potential, while the photoelectric conversion element is held at a lower potential. The admitted prior art does not teach any potential setting means for generating a voltage different from the power supply voltage, wherein the output of the potential setting means is applied as a pulse to the gate of the transfer or reset switch means. Regarding claims 2-4, the admitted prior art also does not teach that the amplitude of the pulse applied to the transfer gate is smaller, and thus different, than that of the pulse applied to the reset gate.

Williams teaches that the floating diffusion and reset areas are held at the same potential, while the photoelectric conversion element is held at a lower potential. Williams also teaches that the amplitude of the pulse applied to the transfer gate is smaller than that of the pulse applied to the reset gate (Fig, 6, and col. 2, lines 10-49). Since the voltage levels are different, at least one of the voltages will be different from the power supply voltage. Because the amplitudes of the pulses are different, at least one potential setting means to set different voltage levels for the transferring MOS transistor and resetting MOS transistor are inherent.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the apparatus taught by the admitted prior art with the potential setting means inherent in the method of applying different voltages to the transfer and reset gates taught by Williams to create a solid state image sensing apparatus with a photoelectric conversion element, transfer gate, floating diffusion area, and reset gate, wherein the voltages applied to the transfer and reset gates differ. One of ordinary skill in the art would be motivated to make such a change because different voltages are needed in regions requiring different threshold voltages for activation to ensure proper conditions for transferring charge.

Regarding claims 5 and 6, the admitted prior art teaches that the photoelectric conversion element is a PN photodiode formed on a semiconductor substrate (page 1, lines 18-26).

As best understood from the language of the claim, regarding claim 7, the admitted prior art teaches a solid state image pickup apparatus (page 1, lines 11-13) comprising a PN junction capable of photoelectric conversion (page 1, lines 18-26, and page 5, lines 23-24). The admitted prior art also teaches a transfer gate for transferring a signal charge generated in the PN junction, a floating diffusion area for receiving the signal charge, and a reset gate for resetting the potential of the floating diffusion area (page 2, lines 4-15, page 5, lines 24-26, page 6, lines 6-9, and Fig. 4). Because the apparatus is a CMOS sensor (page 5, line 18), the transfer and reset switches will be fabricated from MOS transistors. The admitted prior art does not teach a first potential setting means for setting the voltage applied to the gate of the transferring MOS transistor or a second potential setting means for setting the voltage applied to the gate of the resetting MOS transistor.

Williams teaches that the amplitude of the pulse applied to the gate of the transfer switch means is smaller from that of the pulse applied to the gate of the reset switch means (Fig. 6, and col. 2, lines 10-49). Since the amplitudes of the pulses are different, separate potential setting means to set different voltage levels for the transferring MOS transistor and resetting MOS transistor are inherent.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the apparatus taught by the admitted prior art with the multiple potential setting means inherent in the method of applying different voltages to the transfer and reset gates taught by Williams to create a solid state image sensing apparatus with a PN junction

capable of photoelectric conversion, transferring MOS transistor, floating diffusion area, and resetting MOS transistor, wherein the apparatus also comprises a first potential setting means to set the voltage applied to the gate of the transferring MOS transistor and a second potential settings mean to set the voltage applied to the gate of the resetting MOS transistor. One of ordinary skill in the art would be motivated to make such a change because different voltages are needed in regions requiring different threshold voltages for activation to ensure proper conditions for transferring charge, and thus a separate potential means is required for setting each voltage level.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dorothy Wu whose telephone number is 703-305-8412. The examiner can normally be reached on Monday-Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Williams can be reached at 703-305-4863.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, DC 20231

Or faxed to:

703-872-9314

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,

Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is 703-306-0377.

Dorothy Wilson

DW
January 9, 2003

KAWilliams

Kimberly A. Williams
Primary Examiner
Technology Center 2700